Infrastructure Management In Rural Development - A Study In Nagamalai Pudukottai Of Madurai District

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Abstract: The appropriate role of rural infrastructure in the economic development of developing countries has remained a largely unexplored and underrated issue. World Bank report pointed out the statement the productivity growth is higher in countries with an adequate and efficient supply of infrastructure services. In 2011 census the population growth rate recorded as 51.60% in rural area. Indian government put effort to eliminate poverty and to improve the quality of life of rural people. At present rural GDP is 5 times lesser than the urban GDP. The main objective of the study is to improve the basic infrastructure facilities in the rural area thus enhance the health, education and living condition. A set of 5 indicators has been considered to represent the level and pattern of economic infrastructural development at the rural area. They are Access indicators, Quality indicators, Fiscal costs & revenue indicators, Utilization indicators and Affordability indicators .The proposed study attempts to analyze the existing infrastructure facilities in terms of comparing those with the standards.

Keywords: Rural infrastructure, Development indicators, Standards.

I. INTRODUCTION

Any successful development must have take into account of social, economic, cultural, environmental, and geographic realities that shape the lives of people all over the world. In 2011 census, about 68.84 per cent of Indians live in villages (638,691). However, India's rural share in total national income is less than 45 per cent. Rural India can characterized by low income levels, poor quality of life and weak human capital base. 37 per cent of population remains below poverty line not able to meet basic necessities of life.

Nearly half the rural population is still illiterate (50.56 per cent). On the health front, the situation is far worse. The infant mortality rate is 63.19 per thousand live births. Only 31 per cent of population with access to sanitation. More than half of the children falls under five years in rural areas are undernourished and 60 per cent of the rural households do not have electricity connection.

The government has identified that 15 basic amenities must enhance quality of life in villages. These include drinking water, playgrounds, open-air theatres, individual toilets, rural roads, burial ground, animal shelters, community harvesting grounds, citizen service centres, water harvesting, roads to forms, self- employment facilities, public libraries and village tanks/lakes. The major recommendations in terms of strengthening the linkage between all infrastructures. The move is aimed at arresting the migration of rural people towards urban areas.

RURAL AREA

In general, Sparsely populated area outside of the limits of a city or town or a designated commercial, industrial, or residential center. Rural areas are characterized by farms, vegetation, and open spaces. Typical rural areas have a low population density and small settlements. Agricultural areas are commonly rural, though so are others such as forests. Different countries have varying definitions of "rural" for statistical and administrative purposes.

INTEGRATED INFRASTRUCTURE RURAL DEVELOPMENT APPROACH

The integrated infrastructure development approach emphasis is the need of coordinating different agencies under a single system management of essential components required to get rural development moving. The management must enables the systematic, coordinated planning and programming of investments or expenditures, design, construction, maintenance, rehabilitation, renovation, operation, and in-service evaluation of physical facilities. There are various infrastructure sectors categorized.

CLASSIFICATION OF INFRASTRUCTURE SECTOR

S. No	Category	Infrastructure sub-sectors
1	Transport	✓ Roads and bridges ✓ Ports ✓ Inland waterways ✓ Airports ✓ Railway Track, tunnels. viaducts, bridges
2	Water and Sanitation	✓ Solid Waste Management ✓ Water supply pipelines ✓ Water treatment plants ✓ Sewage collection, treatment and disposal system ✓ Irrigation(dams, channels, embankments etc) ✓ Storm Water Drainage System
3	Social and Commercial Infrastructure	✓ Education Institutions(capital stock) ✓ Hospitals(capital stock) ✓ Common infrastructure for industrial parks, SEZ, tourism facilities and agriculture markets. ✓ Fertilizer(Capital investment)
4	Communication	✓ Telecommunication Towers
5	Energy	✓ Electricity Generation ✓ Electricity Transmission ✓ Electricity Distribution ✓ Oil pipelines

Table 1: Infrastructure classification

ISSUES IN RURAL INFRASTRUCTURE DEVELOPMENT

✓ The major constraint in the provision of rural infrastructure is the lack of financial resources.
✓ Unawareness of scheme benefits.
✓ Lack of people's participation.
✓ Distress migration from rural to urban areas.

OBJECTIVE OF THE STUDY

✓ To identify the problems in infrastructure facilities in the rural area to arrive suitable methodology through literature survey.
✓ To examines different infrastructure sub-sectors (transport, solid waste and water etc) in detail and explores their linkages with rural development.
To prioritize and link the factors thereby providing possible suggestions to improve the integrated development.

II. REVIEW OF LITERATURE

Jakub Straka and Marcela Tuzova (2016) His study shows number of various criteria, such as economic, social, cultural or environmental which can be used to assess rural development. Local actors (e.g. mayors of municipalities, representatives of Local Action Groups) are generally considered as the key players in rural development process. They very well know the rural area and have a clear vision of the possibilities of its development. With this in mind, it is appropriate to involve these actors to the process.

Bulus, J. S et al (2014) findings from a survey in Nigeria indicate the infrastructure in rural areas helps to Increase employment and income, Increase efficiency and productivity - For instance time saved due to improved transportation infrastructure can be used on other activities, Increase access to resources, Improve health and therefore productivity- For instance, if water supply is augmented, water-related health diseases can be reduced.

Philip H et al (2008) This paper defines issues as well as goals for rural water and sanitation projects in developing countries as well as presents some of the barriers to their sustainability The author has worked with several NGOs in the development and assessment of rural water and sanitation projects in Guatemala. People in rural communities around the world are being empowered by the three-legged stool concept of clean water, sanitation, and basic hygiene training. Where water committees have formed, there is often an increased presence of women in community leadership roles and the communities are about the business of community betterment.

Vimal (2000) presented the problems and prospects of watershed development in India, and recommended the importance of mass involvement in both water and land resource management.

Canning (1999) Attempt has been made to estimate the general productivity of infrastructure. The outcome of this study is that investment in some of the specific infrastructure would increase the productivity manifold.

Thippaiah and Devendra Babu (1986) have come out in their study with some major defects in the implementation of the programme Non-identification of proper persons as beneficiaries, non-availability of trained personnel, misuse of loans and poor repayment position and lack of infrastructural facilities are some of such defects.

III. PROJECT STUDY AREA

Madurai is one among the seven largest cities in the State of Tamil Nadu. The geographical setting of Madurai city is unique with its location as Growth Pole in the Southern part of the State of Tamil Nadu. It is located at a distance of about 450 km south-west of Chennai, the Capital of the State of Tamil Nadu and is on 9° 55" 59'North Latitude, 78° 7" 0'East Longitude and it is 100 mts. above mean sea level. The perennial river Vaigai passes through the city and the area spreads on both sides of the river. The city is strategically located at the junction of National Highways No.7, 45B and 49 etc., Trade, tourism and pilgrimage have been driving forces for such developments. There is always a heavy inflow /outflow of floating population (3lakh / day). The city surrounded by elegant natural plantations. Technical institutes and textile mills are in good numbers.

Figure 1: Madurai District Map

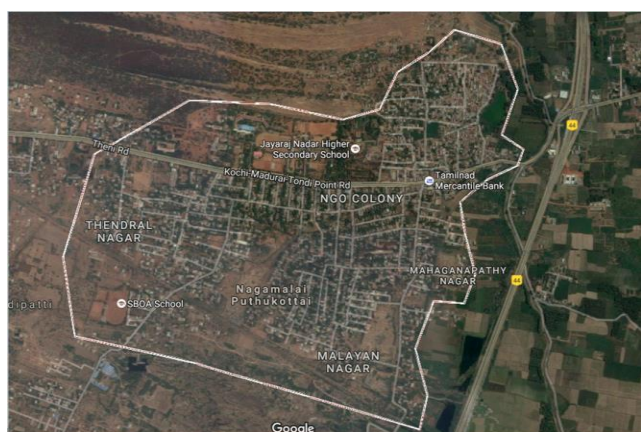### STUDY AREA – NAGAMALAI PUDUKKOTAI

Figure 2: Study area- Nagamalai Pudukottai

Madurai district comprises seven Taluk. Madurai (North), Madurai (South), Thirumangalam, Peraiyur, Usilampatti, Vadipatti, Melur, Theni. For this study the Nagamalai Pudukottai rural area were selected. The selected area located in Madurai West Taluk which falls under Thiruparangunram panchayat union. Total area covered 3032.6 hectare. Revenue village for Nagamalai Pudukkotai is Villachery. Total population in the study area 15,769 persons.
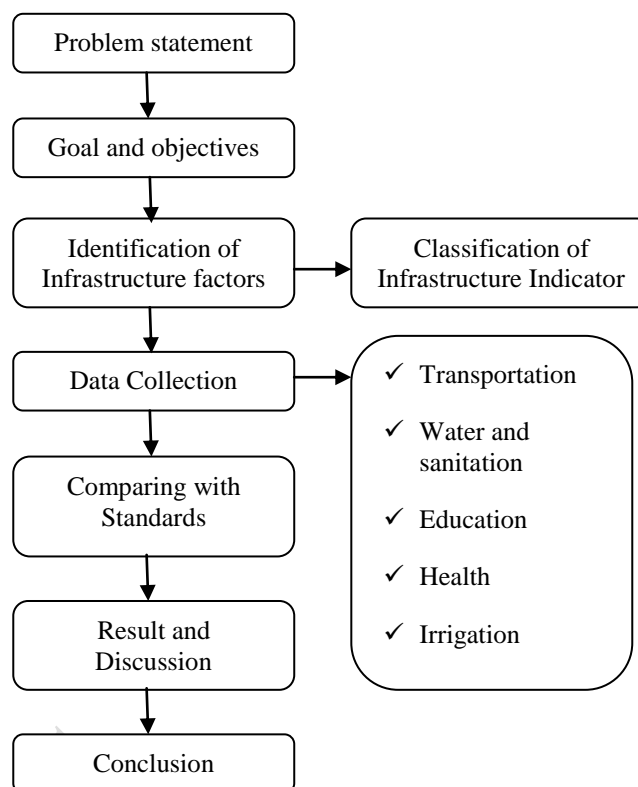
IV. FRAMED METHODOLOGY

Figure 3: Framed methodology

The framed methodology explored about existing condition of infrastructure status at Nagamalai Pudukottai and found deficit comparing with standards. The main infrastructure were selected for this study i.e, Transportation infrastructure, Water and sanitation infrastructure, Health infrastructure and School infrastructure. Using the indicator that can be show the changes or progress a programme this will make toward achieving a specific outcome. Based on the infrastructure the indicator may apply or not. The suitable indicators are selected for specific infrastructure management. For ex: if we take transportation infrastructure it include access indicator in terms of Road length, Registered Motor Vehicles. Quality indicator it provide surface road, accident. Utilization indicator it can provide registered vehicle ownership and Fiscal cost and revenue indicator include road expenditure and spending etc..,

The primary data were collected from the thiruparangunrram panchayat union office. The data include all infrastructure facilities provided in that study area. Using this data the study were taken up by comparing to the standards provided for the rural areas .For example Rural National Drinking Water Program(NRDWP).National highway 49 crossing over the study area this can also include in the study.

NEED FOR THE STUDY

To enhance the overall rural development and to create integrate infrastructure thus provide recommendation for planners and policy makers.

V. RESULT AND DISCUSSION

A. WATER SUPPLY AND SANITATION INFRASTRUCTURE

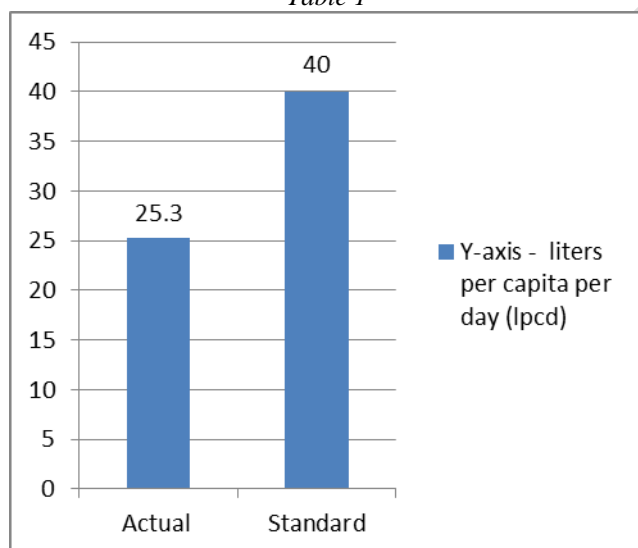| INDICATORS	FACTORS	ACTUAL	STANDARD
Access indicators	Water Facilities:		Accelerated Rural Water Supply Program (ARWSP): 40 liters per capita per day (lpcd) of safe drinking water for human beings. 400000/15769 = 25.3 lpcd
	Overhead tanks	12	
	Street pumps	11	
	Handpumps	265	
	Syntax tanks	12	
	Toilet Facility	4500	
	Panchayat fund	400	
	Integrated Men Sanitary Complex (IWSC)	1	
	Solid waste management	EXNORA – NGO with the help of Self help groups.	Street light provision generally 1 in 40m Area covered 30326 30326 /40=760
	Street lighting	567	
	Solar lighting	3	
	Revenue generation from R.O Plant	Rs 15,1132	

Table 1

Figure 4: Water demand projection

The above figure 4 shows the demand of water supply. According to National Rural Drinking Water and Sanitation 40 liters per capita per day (lpcd) of safe drinking water for human beings.15 litres per capita per day were demand for per person.
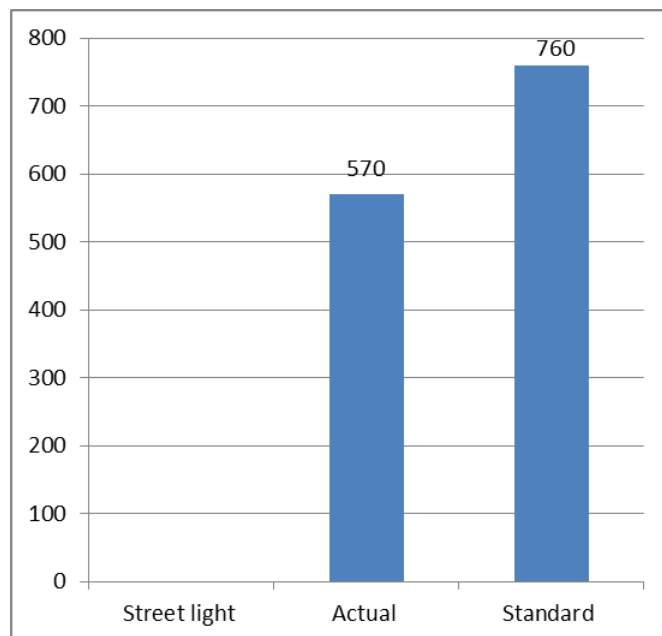

Figure 5: Street light deficit

Street light is more important in streets and extension areas. This can be provided 1 in 40m. The deficit of street light is nearly 760 in numbers.

B. EDUCATION INFRASTRUCTURE

FACTORS	ACTUAL				STANDARD
College Profile	N.M.S.S Vellachamy Nadar College				
	Boys	Girls	Total	Staff	Student staff ratio 30:1 = 77
	1604	686	2290	60	
Teacher Training Institute	Kapi TTI Nagamalai				
	Boys	Girls	Total	Staff	Student staff ratio 30:1 =15
	126	215	341	8	

Figure 6: Education Infrastructure

From the above figure 6 shows the student staff ratio is less while comparing standards. The Right To Education (RTE) Act recommends a PTR of 30:1

C. HEALTH INFRASTRUCTURE

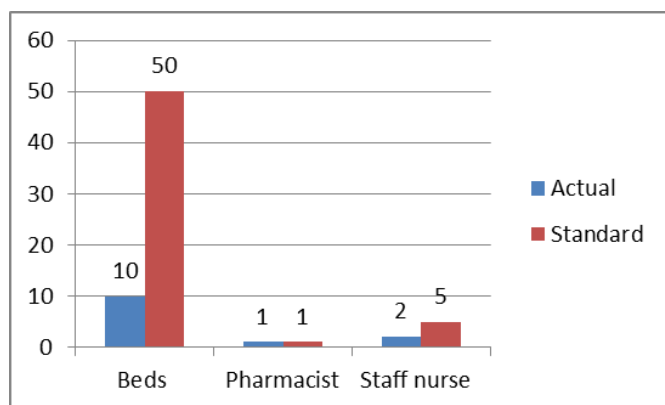| INDICATORS	FACTORS	ACTUAL	STANDARD
Mortality indicators	Life expectancy	22	-
	Infant mortality rate	38	-
	Maternal mortality rate	0	-
Nutritional indicators	Proportion of low birth weight	2.20%	-
	Death rate (per 1000 pop)	5.80%	-
Affordability indicator	Public health care	Beds – 10	50 beds in health care
		Pharmacist – 1 Staff nurse -2	Pharmacist -1 Staff nurse -5

Figure 7: Health infrastructure
Lack of staff nurse in the health center.

D. COMMUNICATION INFRASTRUCTURE

INDICATORS	FACTORS	ACTUAL
Access indicators	Rural DELS	8
	Wireline Connections	4
	Post Offices	1
	PCOs	6
	Letter Boxes	5
Quality indicators	Postal Employees	5

E. TRANSPORTATION INFRASTRUCTURE

INDICATORS	FACTORS	ACTUAL	S STANDARD
Access indicators	Road length	5000m	The total population in the area is 15,769. The range of population above 15,000 its comes under Class V. Based on the population accessibility of road plays a major role. This become more insufficient for the people.
	Registered Motor Vehicles	10,258	
Quality indicator	Surfaced roads	WBM, Cement road, Metal road, Paver block.	
	Accidents	No accident registered inside of the area.	
Utilization indicator	Registered vehicles Ownership	9,462	

VI. DISCUSSION

Infrastructure is one of the pillars of economic transformation. Based on the five indicators the result were discussed. Access to basic water supply and sanitation services is highly inadequate according to Accelerated Rural Water Supply Program (ARWSP) says 40 liters per capita per day (lpcd) of safe drinking water for human beings. There are three private school and one private college surrounding Nagamalai pudukottai here the facilities provided by the government have attracted larger number of students towards government school. Solid waste management was carried EXNORA – NGO with the help of Self help groups.

VII. CONCLUSION

Realizing that provision of rural infrastructures is basic to rural economic development, this study has endeavoured to bring into focus the condition, maintenance and variation in rural infrastructural facilities in nagamalai pudukottai. Thus from the above analysed ways community participation in rural development seems handy as it provides employment, knowledge, social bonding and more space for empowerment and sustainability.

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